

Development of Protocols to Identify and Evaluate Critical Ecosystems

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Healthy, functioning ecosystems are critical to the sustainability of human and natural communities, but the identification of areas of healthy ecosystems in an area as large as Region 5 is difficult due to time and information constraints. Geographic Information Systems (GIS) are useful for combining many different types of spatially explicit data over large areas and can develop a composite map of a particular feature of interest (in this case, healthy ecosystems). However, the resulting composite maps from GIS techniques need to be verified with data collected on the ground before these maps can be used as proxies for on-the-ground conditions. Funded by the RARE program, ecologists at ORD and Region 5 have been developing quick-assessment protocols that will be used to identify and evaluate critical ecosystems. In 2003, a panel of about 30 ecological experts developed field data collection protocols that can be completed within four hours for a 300 by 300 meter site for collecting the types of data that indicate healthy ecosystems and habitats. The experts developed four protocols, specific to land cover type: open water, forested and unforested wetlands, grasslands/shrublands/dunes, and forests (deciduous, coniferous, and mixed). The protocols call for a variety of data to be collected, including information on plant and animal communities and human disturbance. These protocols will be used in 2004 to collect on-the-ground conditions for 150-250 randomly chosen sites across Region 5 to verify the composite GIS map. The combination of quick-assessment protocols and the GIS methodology developed in this project will be used in Region 5 to support environmental protection and restoration efforts and can be exported to other Regions to identify areas of critical ecosystems throughout the United States. The methodology proposed here, to identify critical ecosystems using several complementary processes, will be transferrable to all other EPA Regions. All Regions are currently facing rapid urbanization, with loss of both agricultural and natural areas that once served to mitigate for urbanization effects (e.g., increased flood events, air pollution). Identifying the remaining critical ecosystems is important, as these areas will have a high conservation and management priority.